

REMARKS

The non-final Office Action mailed April 21, 2005 and the references cited therein have been carefully considered. Claim 1 has been amended and new Claims 20-24 have been added in a sincere effort to further clarify that which Applicants regard as the invention.

Support for this Amendment is found generally within the specification, claims, and drawings, as originally filed. Specifically, support for the amendments to Claim 1 and new Claims 20-24 is provided at page 2, paragraphs 7 and 8; page 5, paragraphs 25 and 26; page 6, paragraphs 27-29; page 7, paragraphs 30 and 31; and page 8, paragraphs 32-35 of the specification and shown in Figures 3-6.

Claims 1-12 and 14-19 were rejected as being unpatentable over U.S. Patent No. 6,241,684 to Amano (*Amano*). It is assumed that Claim 13 was considered allowable, although no specific reference to allowable subject matter was provided in the Office Action.

The present invention is directed to a carry-on heart rate monitor that measures a person's heart rate non-invasively. The heart rate monitor comprises a display that displays heart rate information about a heart rate signal measured on the person, which includes a display element that displays a settable minimum limit for a desired heart rate level, a display element that displays a settable maximum limit for a desired heart rate level, and a display element unit controlled by the measured heart rate level and provided with a plurality of display elements segments. At least one of the display element segments is activated in response to the measured heart rate level and graphically represents the measured heart rate level by a position of the at least one activated display element segment relative to the display element segment for displaying the settable minimum limit for the desired heart rate level and the display element segment for displaying the settable maximum limit for the desired heart rate level.

The display element for displaying a settable minimum limit for the heart rate level is located at a first end of the display element unit controlled to the measured heart rate level on the same side of the display as the first end of the display element unit. The display element unit for displaying a settable maximum limit for the heart rate level is located at the second end of the display element unit controlled according to the heart rate level on the same side of the display as the second end of the display element unit. The heart rate monitor is adapted for being a carry-on heart rate monitor, as now defined by amended Claim 1.

It is respectfully submitted that the Office Action fails to refer to Claim 1 as amended prior to this Response by not reciting that at least one of the display elements segments controlled by the measured heart rate level graphically represents the heart rate by a position of the at least one display element segment relative to the display element for displaying the settable minimum limit for the desired heart rate level and the display element for displaying the settable maximum limit for the desired heart rate level. Accordingly, it is submitted that the patentability of Claim 1 has not been considered in view of this feature.

Figure 31 of *Amano* is cited in the Office Action. However, although the specification does not provide any details regarding these features, Figure 31 apparently shows numeric displays for an "AVE" or average heart rate level (having a value of 153 in Figure 31), a "TARGET" or target heart rate level (having value of 158 in Figure 31), and a current heart rate level (having a value of 165 in Figure 31) in the right-hand portion of the lower display area.

The left-hand portion of the lower display appears to provide (although the specification of *Amano* is again silent with respect to this feature) an overall exercise profile in terms of exercise intensity (a quantity that is discussed throughout *Amano*) during an exercise session. Such displays are commonly provided on electronically controlled exercise apparatus, such as treadmills, stair climbers, and the like.

Thus, *Amano* merely teaches the display of numeric values for the average, target, and current heart rate levels. However, nothing in *Amano* or any of the references of record would teach or suggest a graphical representation of the measured heart rate level by a position of at least one activated display element segment relative to a display element for displaying minimum and maximum limits, as now defined by amended Claim 1.

For example, Figure 6 of the subject application, which is reproduced below, shows that the minimum limit for the desired heart rate level (display element 201 having a value 120) is displayed at a first end of the display element unit 210 and the maximum limit for the desired heart rate level (display element 202 having a value 145) is displayed at a second end of the display element unit 210. The display element unit 210 comprises several segments 211-220, wherein at least one of the segments 211-220 (segment 215 in Figure 6) of the display element unit 210 is activated in response to the measured heart rate level to graphically represent the measured heart rate level by a position of the at least one activated segment (215) relative to the settable minimum and maximum limit displays.

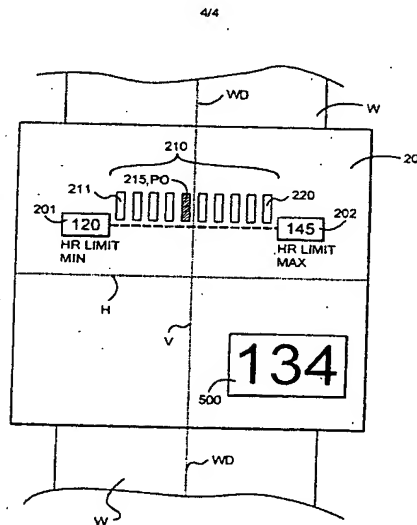


Fig. 6

Thus, Applicants strongly disagree with the contention that the invention recited in Claim 1 would perform equally well with any type of display unit presented in an easy-to-read format. By incorporating at least one activated display element segment that graphically represents the measured heart rate level by its position relative to display elements for displaying minimum and maximum limits, the user is substantially better and more quickly able to visually associate how the measured heart rate level at any particular instant compares with actual values of the minimum and maximum heart rate limits at a glance, as disclosed at page 1, paragraph 4, and page 2, paragraphs 7 and 8 of the specification.

To further clarify the advantages provided by this feature, assume a graphical representation of the measured heart rate, such as a bar graph, in which the position of an activated segment bears no relationship whatsoever to displayed values of the minimum and maximum heart rate limits. In such a case, the user would be required to (a) remember which direction on the bar graph represents an elevated or depressed heart rate, and (b) remember or look elsewhere for the actual values of the minimum and maximum heart rate limits, rather than obtaining all of this information in one glance.

Accordingly, positioning the minimum and maximum limit displays at the ends of the graphical display and representing the measured heart rate level by a position of at least one activated segment relative to the minimum and maximum limit displays is clearly critical to the subject invention in that by doing so it enhances readability by providing a readily understandable positional association between each of the displays. The reader can use this relationship to more easily interpret and comprehend both the instantaneous relationship between the measured heart rate level and the minimum and maximum heart rate limits, as well as the actual values of the minimum and maximum limits.

Column 2, lines 63-67 of *Amano* are cited in the Office Action as disclosing upper and lower limit values for the pulse rate corresponding to a suitable exercise intensity. Column 21, lines 45-54, appear to describe a corresponding display unit shown in Figure 16,

wherein “the display mode is changed by means of the mode switch M...the display is designed to display the values of an upper limit UL and a lower limit LL”. For example, a pitch rate (value 150 in Figure 16) and a heart rate (value 155 in Figure 16) are first displayed in the display unit shown in Figure 16. The user must then press the mode switch M in order to view the upper and lower limits of the heart rate. Therefore, the display mode must be switched manually by the user in order to view the upper and lower limit values, which is cumbersome during exercise. Even then, the heart rate values are merely displayed numerically with no graphical representation of the measured heart rate relative thereto.

This contrasts with the present invention, in which the measured heart rate level is graphically represented by the position of an activated segment relative to the settable minimum and maximum limits. Accordingly, the subject invention does not require the user to switch display modes in order to see the measured heart rate with respect to the desired minimum and maximum limits.

Figures 51-53 of *Amano* were cited in rejecting Claims 7, 8, and 15 as disclosing a display of minimum and maximum heart rate limits. However, Figures 51-53 clearly refer only to target and current values of exercise quantity and exercise intensity in units of kilo-pound meters (kpm) and kilo-pound meters per minute (kpm/MIN), respectively, as defined at column 8, lines 17-20.

The features recited in new Claims 20-24, include a direction of motion resulting from the activation of at least one display element segment being substantially parallel to a center line H that is substantially parallel to the reading direction or parallel to the reading direction of the minimum and maximum limits, spaced-apart display element segments, and minimum and maximum limit displays that are numeric, as clearly shown in Figure 6 above. These features, in addition to those recited in Claim 1, significantly enhance the readability of the subject heart rate monitor beyond that of conventional displays, and are disclosed at page 2,

paragraphs 7 and 8; page 6, paragraphs 28 and 29; and page 7, paragraph 30 of the specification, as well as being shown in Figures 4-6.

Applicants respectfully note that in order to support a claim of *prima facie* obviousness, the cited references must teach or suggest each and every element of the invention, and there must be a motivation in the references or the prior art to combine the references and the prior art as suggested.

However, nothing in the art of record would teach or suggest, either alone or in combination, a carry-on heart rate monitor that measures a person's heart rate non-invasively, wherein at least one of the display element segments is activated in response to the measured heart rate level and graphically represents the heart rate level by a position of the at least one display element segment relative to the display element for displaying the settable minimum limit for the desired heart rate level and the display element for displaying the settable maximum limit for the desired heart rate level, as now defined by amended Claim 1.

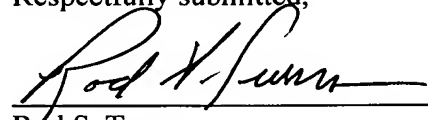
Further, nothing in the art of record would teach or suggest such a monitor wherein the display element for displaying a settable minimum limit is located at a first end of the display element unit controlled according to the heart rate level, on the same side of the display as the first end of the display element unit, and the display element for displaying a settable maximum limit is located at a second end of the display element unit controlled according to the heart rate level, on the same side of the display as the second end of the display element unit, as now defined by amended Claim 1.

Applicants respectfully submit that Claims 2-19, which ultimately depend from Claim 1, are patentable over the art of record by virtue of their dependency from Claim 1. Further Applicants submit that Claims 2-19 define patentable subject matter in their own right. Therefore, it is respectfully submitted that the rejection of Claims 1-12 and 14-19 (as well as Claim 13, if this was intended by the Examiner) under 35 U.S.C. §103(a) be reconsidered and withdrawn.

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In view of the foregoing Amendment and remarks, entry of new Claims 20-24 and the amendments to Claim 1; favorable consideration of new Claims 20-24 and Claim 1, as amended; favorable reconsideration of Claims 2-19; and allowance of pending Claims 1-24 are respectfully and earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rod S. Turner", is written over a horizontal line.

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